THE RISE OF THE MACHINES
UNDERSTANDING HOW DATA ACCELERATES AI

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DATA...

...HOW MUCH?
THE INTERNET . . .
2016: 1,100 EXABYTE
WHAT IS AN EXABYTE?
ALL TEXT CONTENT × 100,000 = 1 EXABYTE
4.9 Zettabyte p.a. (that's 5x the internet)
2025

180,000,000,000,000,000,000,000 Byte
(180 Zettabyte = 180,000 Exabyte)

Source: IDC
65M YEARS TO DOWNLOAD

Extinct

Download

Today

Download Complete
Exponential Growth

$g(x) = 2^x$

Computing
Data capture
Data sources
THE MACHINES ARE COMING
\[ V \sim N^2 \]

\[ f(x) = x^2 \]
A MACHINE IS A DATA NODE
FACTORY WORKER
Apple supplier Foxconn replaces 60,000 workers with robots at China factory

Employee numbers at the Foxconn factory in Kunshan were slashed from 110,000 to 50,000
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Doug Bolton | @DougieBolton | Wednesday 25 May 2016 | 1 comment
Cheetah Robot runs 28.3 mph; a bit faster than Usain Bolt
WaveNet: A Generative Model for Raw Audio

Aaron van den Oord, Sander Dieleman, Heiga Zen, Karen Simonyan, Oriol Vinyals, Alex Graves, Nal Kalchbrenner, Andrew Senior, Koray Kavukcuoglu

(Submitted on 12 Sep 2016 (v1), last revised 19 Sep 2016 (this version, v2))

This paper introduces WaveNet, a deep neural network for generating raw audio waveforms. The model is fully probabilistic and autoregressive, with the predictive distribution for each audio sample conditioned on all previous ones; nonetheless we show that it can be efficiently trained on data with tens of thousands of samples per second of audio. When applied to text-to-speech, it yields state-of-the-art performance, with human listeners rating it as significantly more natural sounding than the best parametric and concatenative systems for both English and Mandarin. A single WaveNet can capture the characteristics of many different speakers with equal fidelity, and can switch between them by conditioning on the speaker identity. When trained to model music, we find that it generates novel and often highly realistic musical fragments. We also show that it can be employed as a discriminative model, returning promising results for phoneme recognition.

Subjects: Sound (cs.SD); Learning (cs.LG)
Cite as: arXiv:1609.03499 [cs.SD]
(or arXiv:1609.03499v2 [cs.SD] for this version)
Robots That Teach Each Other
What if robots could figure out more things on their own and share that knowledge among themselves?

Availability: 3-5 years
by Amanda Schaffer
RIP. IT WAS GOOD WHILE IT LASTED...

Clifford Chance strikes deal with artificial intelligence provider Kira

AI Lawyer “Ross” Has Been Hired By Its First Official Law Firm

IN BRIEF

Ross, the world’s first artificially intelligent attorney, has its first official law firm. Baker & Hostetler announced that they will be employing Ross for its bankruptcy practice, currently comprised of almost 50 lawyers.

The deal means CC’s lawyers will be able to use the AI software for tasks such as document review in M&A due diligence.

The firm said it has already used AI technology in several other applications but declined to provide details.

Written by
Cecile De Jesus
May 11, 2014
Elon Musk reveals more about his plan to merge man and machine with Neuralink

The SpaceX and Tesla founder wants to prepare humans for the rise of artificial intelligence by helping us merge with computers.
Data is at the centre.
DEEPFACE: CONVOLUTIONAL NEURAL NETWORKS

FACE RECOGNITION WITH 98% ACCURACY

(THAT IS BETTER THAN A HUMAN - OR THE FBI)
An Artificial Intelligence Developed Its Own Non-Human Language

When Facebook designed chatbots to negotiate with one another, the bots made up their own way of communicating.

ADRIENNE LAFRANCE | JUN 15, 2017 | TECHNOLOGY
ALPHA GO

ADVANCED TREE SEARCH
2 NEURAL NETWORKS
(POLICY & VALUE)
12 NETWORK LAYERS
REINFORCEMENT LEARNING ALGORITHMS
More Dimensions
MORE NETWORK NODES + MORE SENSORS + MORE RAW DATA

+ MACHINE LEARNING + ARTIFICIAL INTELLIGENCE

= MORE STRUCTURED DATA = MORE SENSE
The future comes even faster...

\[
h(x) = x^2 + 2^x
\]

\[
g(x) = 2^x
\]

\[
f(x) = x^2
\]
Today is the slowest pace of progress you will ever know.

Phrase coined by Jonathan Macdonald.
THANK YOU!

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